

SEP 2 1944

A28

# AGRICULTURAL NEWS LETTER

VOL. 12 - NO. 5

SEPTEMBER-OCTOBER, 1944

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations of the du Pont Company and its subsidiary companies. It also contains published reports and direct contributions of investigators of agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.



ISSUED BY PUBLIC RELATIONS DEPARTMENT, E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON 98, DEL.



AGRICULTURAL NEWS LETTER

Published by the Extension Division  
Public Relations Department  
E. I. du Pont de Nemours & Company (Inc.)  
Wilmington 98, Delaware

L. F. Livingston, Manager  
Extension Division

Gus M. Oehm  
Agricultural Editor

Gertrude Dieken  
Home Economics Consultant

M. H. Bruner, Agricultural  
Consultant, Clemson, S. C.

V. S. Peterson, Agricultural  
Consultant, Ames, Iowa

Du Pont Advisory Board

Ward H. Sachs, Agronomist  
Ammonia Department

Gilbert F. Miles, Manager  
Du Pont-Semesan Research Laboratory

Dr. W. H. Tisdale, Director  
Pest Control Research Laboratory

Dr. H. F. Dietz, Entomologist  
Pest Control Research Laboratory

CONTENTS

	<u>Page</u>
Lightning Injury to Soybeans Sometimes Mistaken for Plant Disease.....	73
"Synthetic Urea Proves Satisfactory for Dairy Rations" - U. S. D. A.....	74
Leaflet on Urea for Feed Prepared by N. Y. Food Commission.....	75
Cornell Animal Husbandmen Review Data on Urea In Dairy Rations.....	75
Elimination of Weed Growth in Tobacco Plant-Bed Soil.....	76
Nitrogen Uptake by Grapefruit Trees in Salt River Valley.....	78
First "Agricultural Experiment Station".....	79
Late-Harvested Apples Are Bigger and Better.....	80
"Fermate" New Remedy for Control of Bean Anthracnose.....	82
Increased Efficiency Results from Proper Fertilizer Placement.....	83
Phenothiazine in Regular Mash Controls Cecal Worms in Chickens.....	84
Dosing with Phenothiazine One Way to Save Hog Feed.....	85
Smear 62 Included Among Most Important Results of Recent Research.....	86
U. S. D. A. Warns Stockmen of Threatening Screwworm Outbreaks.....	86
How to Recognize Screwworm -- How It Operates.....	87
Missouri Leaflet Warns Screwworm Menace Moving North.....	87
No Longer Any Need To Give Stinking-Smut Fungi Free Board.....	88
Booklet Gives Facts on Care of Engine's Cooling System.....	89
The Importance Of Half An Egg.....	90
Ditch Dynamiting "Blows Away" Flood Troubles in Iowa.....	91
U. S. D. A. Says DDT Not Effective for All Purposes.....	92

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

1924

LIGHTNING INJURY TO SOYBEANS SOMETIMES MISTAKEN FOR PLANT DISEASE

Soybeans suffer not only from the ravages of fungous, bacterial, and virus diseases that attack the leaf, stem, pod, and seed, but appear to be more subject to lightning injury than many other crops.

Plant pathologists point out that dead and blackened areas, 40 to 50 feet in diameter, in fields of young soybean plants are sometimes mistaken for some mysterious root-rotting parasitic disease.

Lightning makes an almost complete kill of the soybeans, but some weeds in the affected places are injured much less severely. When the plants are practically full-grown and in the blooming stage or after pods are formed, the area of killed plants is usually only about 15 feet across, but surrounding it is a wide border of plants with blackened stems and blighted leaves.

Suitable Seed Treatment Often Improves Stand

This interesting new information is reported in U. S. Department of Agriculture Farmers' Bulletin No. 1937, "Soybean Diseases and Their Control," which summarizes its seed-treating discussion as follows:

"It appears that suitable seed treatment will frequently improve the stand of soybeans, especially when the vitality of the seed is not very high. The use of certain disinfectants seems to be no deterrent to successful inoculation of the seed and subsequent nodulation."

Results of Experiments in Several States

The bulletin reports results of North Carolina Experiment Station experiments, where "Semesan" fungicide dusts and solutions were among the materials which increased the percentage of germination. Among other things, these tests showed that gain in germination, due to the use of organic mercury disinfectants, may be sufficient to make soybean seed treatment profitable entirely apart from any benefit accruing from control of seed-borne diseases.

The publication also tells of tests at the Oklahoma Experiment Station in which "New Improved Ceresan" seed disinfectant was one of two materials which were effective in preventing seed rots and pre-emergence damping off when the seed of Virginia soybeans were sown in soil naturally infested with Rhizoctania solani.

It also says that, in experiments at the Illinois Agricultural Experiment Station, "Semesan Jr." was one of several disinfectants used with success on soybean seed planted in clean river sand. Emergence of the different untreated samples ranged from 9 to 97 per cent, with all of the disinfectants (except one) causing a significant increase in stand.

Continued on next page

### Effect of Seed Treatment on Nodulation

Tests on effect of seed treatment on nodulation were also made at the Illinois Agricultural Experiment Station using both sterile soil and sand. The seeds were first treated with fungicide, followed by a standard wet inoculation made one hour before planting. "Ceresan" and "Semesan Jr." both inhibited nodule formation on the taproot, before there was good nodulation on the lateral roots. In appearance, the plants from seed treated with these materials were as efficient in nitrogen fixation as the untreated and much better than the uninoculated.

#####

### "SYNTHETIC UREA PROVES SATISFACTORY FOR DAIRY RATIONS"--U.S.D.A.

"During the last 12 months even the all-time record supplies of protein feed have been inadequate to meet all demands, and this has focused the attention of research workers and others on the possibility of feeding synthetic urea to dairy cattle and other ruminants to meet their protein requirements," according to the U. S. Agricultural Research Administration. A recent U.S.D.A. statement says in part:

"Urea, a synthetic product made from coal, air, and water, contains no protein itself, but it does furnish the nitrogen needed to make protein. The bacteria in the paunch of the cow or sheep or other ruminating animals, combine the nitrogen of the urea with other feed constituents to make protein in much the same way that plants take nitrogen from the soil to make protein.

"In an 80-day feeding experiment recently completed by T. E. Woodward and J. B. Shepherd of the Bureau of Dairy Industry, cows receiving oat hay, corn silage, and a grain mixture consisting of corn, oats, bran, and bone meal produced as much milk when urea was added to the grain mixture as when soybean meal was added, each group averaging about 37 pounds per cow per day.

"The limited quantity of urea now being made available for feed is being allocated largely to feed manufacturers to replace part of the high-protein concentrates they normally use in commercial feed mixtures."

#####

: LEAFLET ON UREA FOR FEED PREPARED FOR N. Y. STATE EMERGENCY FOOD COMMISSION :

: When The Committee on Animal Nutrition of the New York State Emergency :  
: Food Commission wanted a review of the available information on the use :  
: of urea in dairy rations, they assigned the task to F. B. Morrison, J. K. :  
: Loosli, and L. A. Maynard, all of the Cornell University Animal Husban- :  
: dry Department. :

: Subsequently, in a little leaflet called "Cornell Feed Service No. 8," :  
: these livestock research specialists published their findings under the :  
: heading, "Urea As A Substitute for Protein in Rations for Dairy Animals." :

: The following abstract is based on the Cornell report. :  
:

CORNELL ANIMAL HUSBANDMEN REVIEW DATA ON USE OF UREA IN DAIRY RATIONS

Use of urea in commercial cattle feed is no longer in the experimental stage in this country, according to Cornell University livestock research specialists.

The practice of replacing part of the protein supplements in the ration of ruminants originated in Germany before the war, and has been under detailed study in this country for several years. However, insufficient supplies of urea for this purpose, coupled with the time required for development of adequate and conclusive information by American agricultural experiment stations, delayed until recently general acceptance of the practice in the United States.

German dairymen, having long since discovered that young dairy animals grow well on a low-protein ration fortified with urea but fail to grow on the same mixture without urea, have for many years been using special feeds in which urea is a source of supplementary crude protein. These preparations include dried beet slices with urea solution, molasses bran with urea, linseed meal with urea, and even potato flakes with urea.

Urea Now Being Used in Cattle Feeds in the United States

Professors Morrison, Loosli, and Maynard, of the State College of Agriculture, Cornell University, Ithaca, N. Y., point out that "during the past several months hundreds of tons of urea have been used as an ingredient of milking rations for cows." They add: "There has been no prejudice expressed regarding feed mixtures containing urea, and no reports of trouble have been received by the manufacturers of these feeds. This field experience is important in indicating that there will probably be no resistance from dairymen against the use of urea. Therefore, feed mixers should not hesitate to add 1 to 1-1/2 per cent of urea to rations for dairy cows if the extra protein value is needed for more efficient production."

Continued on next page

### Results of Experiments Summarized

The Cornell animal husbandmen, summarizing results of experiments conducted by the University of Wisconsin, state that a basal ration containing neither linseed meal nor urea gave significantly lower milk yields than either the basal ration plus urea or the basal ration plus linseed meal.

"The differences in production on the linseed meal and urea rations were not statistically significant," they continue. "Extensive studies on the composition of the milk showed no significant differences in taste, fat content, or the amount of vitamin A, carotene, ascorbic acid, riboflavin, or pantothenic acid. Breeding records and reproduction were comparable in all three groups. Thus, it appeared that the basal ration was adequate except for milk production. Additional protein, which could be adequately supplied by urea at 1 per cent of the total ration, was necessary to maintain the milk flow above that of the control group."

The Cornell report also mentions the Massachusetts Experiment Station tests from which the research workers concluded that considerable use was made of urea by dairy cows in the test.

-----

NOTE: For new leaflet on "Two-Sixty-Two" Feed Compound, which contains 42 per cent nitrogen in the form of urea, write the Editor, Du Pont "Agricultural News Letter," Wilmington 98, Delaware.

#####

### ELIMINATION OF WEED GROWTH IN TOBACCO PLANT-BED SOIL

Recent research has established the fact that treatment of tobacco plant-bed soil with "Uramon" fertilizer compound 60 to 90 days before seeding will eliminate 70 to 90 per cent of weed growth and help insure superior stands of vigorous tobacco plants.

Practical experiments conducted by the Georgia Coastal Plain Experiment Station at Tifton, Ga., have shown that both "Uramon", which contains 42 per cent nitrogen in the form of urea, and calcium cyanamid, another nitrogen fertilizer which has been used for this purpose for several years, "are effective against weeds, according to the Station's mimeograph Paper No. 22, recently issued.

The Station advises that 100 pounds of one of these two nitrogen-fertilizer materials are required for 100 square yards of plant bed. Here are the Georgia recommendations:

Continued on next page

### Preparation of Soil

In September or early October, plow or disk the plant-bed site thoroughly to pulverize the soil and break all clods. Remove roots and large tufts of grass, and level the bed to the proper contour. Destroy weeds around the area to prevent weed seeds from blowing into the bed after treatment.

### Application of Material

Sometime in September or October when the soil is moist but not too wet to plow, broadcast the material uniformly on the exact plant-bed area. It is usually advisable to divide the material into two equal parts and broadcast each half over the entire area, sowing in opposite directions each time to secure a uniform application.

### Mixing Material With the Soil

Immediately disk the material into the soil at least three times to a depth of 4 to 6 inches. For this purpose a disk harrow is superior to other equipment. Then re-level to the proper contour desired at seeding time.

Another satisfactory procedure is to first broadcast half the material and disk it as deeply as possible two times, and immediately afterward broadcast the remaining half and disk this twice but only about three inches deep.

### Drenching Soil With Water

Immediately after the mixing is completed and on the same day, pour 150 gallons of water on each 100 square yards of area treated. If the soil is very dry, as may be the case at this season, twice this amount may be necessary to wet the soil as deeply as the material was mixed. However, it is preferable that the soil be moist before as well as after the application. Leave the bed unmolested, without any further plowing, until seeding time. If desired, a layer of fresh clean pine straw free of weed seeds may be scattered several inches deep over the surface after the water has been applied. The straw can be removed at seeding time and later used to cover the beds on cold nights and protect the plants from freeze damage.

### Sowing the Plant Bed

In late December broadcast plant-bed fertilizer at the rate of one pound per square yard, and rake or harrow this into the soil about half an inch deep. Sow one rounded tablespoonful of tobacco seed per 100 square yards. The seed may be mixed with sifted moist earth and fertilizer to facilitate sowing. Pack the seed with a roller or "walk" them in so that the soil is packed firm but not hard. It is always advisable to cover the bed the same day of sowing and dig drainage ditches to carry off excess water.

#####

### NITROGEN UPTAKE BY GRAPEFRUIT TREES IN SALT RIVER VALLEY

Nitrogen uptake by grapefruit trees in the Salt River Valley of Arizona was more rapid in the spring and fall than in winter. It was also more rapid in 12-year-old trees growing in light calcareous soil than in 28-year-old trees growing in loam soil, according to R. H. Hilgeman, formerly of the Department of Horticulture, University of Arizona, located at Tempe.

#### Four Sources of Nitrogen Compared

In the experiments reported, nitrogen was supplied to plots at the following rates per tree:  $6\frac{1}{2}$  pounds calcium nitrate, 5 pounds ammonium sulfate,  $2\frac{1}{4}$  pounds urea, and 200 pounds manure. A control plot was not fertilized. One such complete series was set up in each grove in August, December, and February (March in one grove).

#### Nitrogen Content of Leaves Determined

The nitrogen content of leaves taken periodically from the various plots was determined. The leaves on the unfertilized plots showed the influence of the seasonal changes on the nitrogen level. When expressed on the dry-weight basis, young leaves had a high percentage of nitrogen, which decreased as the leaves became older. Between July and November, the percentage of nitrogen increased, followed by a moderate decrease during the winter which culminated in a sharp decrease in late March just prior to full bloom.

The total amount of nitrogen per leaf increased rapidly in April and May, followed by a gradual increase as the leaf became mature, reaching its maximum in October and November. A gradual decrease took place during the winter, followed by a steep decline in late March. This decrease during winter and spring was less than indicated by the dry-weight percentage, due to the continued increase in the dry-weight of the leaves during this period. It was decided to express the nitrogen content as percent of nitrogen on the fresh weight basis since this presented a more accurate picture of the nitrogen levels.

#### Effect of Time of Application

August fertilization induced a high nitrogen level during fall and winter, but failed to produce a marked increase in the new leaves. The December applications increased the nitrogen in the old leaves and caused some increase in the new leaves. February applications did not materially affect the old leaves, but produced high nitrogen levels in the new leaves.

Continued on next page

### Effect of Various Sources of Nitrogen

The uptake of nitrogen from applications of calcium nitrate and urea was practically the same, although the rate of uptake from urea was a little slower, especially in mid-winter. Nitrogen was taken up more rapidly from calcium nitrate, followed by urea, ammonium sulfate, and manure, in order. In the light calcareous soil, approximately the same amounts of nitrogen were taken up by new leaves from each commercial fertilizer. On the loam soil, comparable amounts were taken up from calcium nitrate and urea, with a lesser amount from ammonium sulfate. Fertilization with manure was characterized by a low initial uptake and a prolonged period of response.

#####

### FIRST "AGRICULTURAL EXPERIMENT STATION"

Lammot du Pont, board chairman of the Du Pont Company, said recently in a commemorative address appraising the life of Lavoisier, that the great French scientist, born 200 years ago, "established what was in effect the first agricultural experiment station, where he demonstrated how the yield of crops could be doubled and the stock improved."

"The Father of Modern Chemistry" spent some 600,000 livres for an estate near Blois, and 120,000 more for development of scientific agriculture. Lavoisier drained the poorest land, and through crop rotation, intensive agriculture, and careful fertilization doubled the yield of wheat.

He tried new crops; weighed sowings and yields; measured fertilizer; imported rams from Spain to improve the quality of both sheep and wool; selected better cows for breeding to increase the quantity of milk. And, according to Sidney J. French, one of his biographers, the lot of the peasants on his lands was greatly improved.

#####

LATE-HARVESTED APPLES, HELD ON TREES BY HORMONE SPRAY, ARE BIGGER,  
TASTIER, BETTER COLORED, AND OF SUPERIOR KEEPING-QUALITY

Keeping apples hanging on the trees by preventing pre-harvest drop through use of a hormone spray, or by actually supporting unsprayed fruits with adhesive tape to hold them on, results in increased size, added color, superior flavor, and good keeping-quality, compared with apples harvested eight days earlier.

All of these advantages are in addition to the elimination of considerable loss of fruits that become culls when they are bruised and cut in dropping from the trees just previous to harvest time.

In an experiment reported by Dr. E. P. Christopher and S. A. Pieniazek of the Rhode Island Agricultural Experiment Station at Kingston, several large McIntosh trees were sprayed with what their report calls "one of the commercial hormone products at the manufacturer's recommended strength." The product used was "Parmone" pre-harvest fruit-drop inhibitor which contains naphthalene acetic acid as the active hormone ingredient. About fifteen gallons of spray were applied to each tree.

Use of adhesive tape was for experimental purposes only, to make sure some of the unsprayed apples would remain on the trees for the duration of the studies.

The report, entitled "A Further Evaluation of Hormone Sprays," issued as "Contribution No. 649 of the Rhode Island Agricultural Experiment Station," says data were obtained from three trees sprayed with "Parmone" on September 7, 1942, and from six unsprayed trees. Apples of three of the unsprayed trees were given additional support with the adhesive tape. Samples were taken before the hormone treatment and after eight days, and stored under similar conditions.

"One hundred apples were marked on opposite sides with India ink, and measured with calipers accurate to 1/1000th of an inch," the report says. "All fruit was harvested at the end of eight days."

Summary of Results

Portions of the summary published by Christopher and Pieniazek, follow:

Size -- The volume of the McIntosh apples showed an average increase of 7.28 per cent during the eight days involved in the test. These data are similar to those secured with Rhode Island Greening, and indicate that a reasonable drop during the period of hormone treatment is compensated for by an increase in the size of the apples remaining on the tree.

Color -- Fruit that remained upon the tree for a longer period usually showed better color development. This amount will vary in importance from

Continued on next page

season to season, but a few qualitative data are available. The fruits harvested at the beginning of the test showed an average of 68 per cent of the surface colored, while those harvested later showed 79 per cent of the surface colored.

Eating Quality -- This quality is one of the most difficult things to measure. Taste preference by people not knowing the origin of any given fruit was used. Ten sets of fruit were tasted by 16 different people in mid-January. The fruits which had been held on the tree the extra eight days were preferred to the others in practically every instance. No distinction was discernible between fruits held on by hormone spray or adhesive tape.

Storage Condition -- During the 1942-43 season very large quantities of McIntosh apples in commercial and farm storages developed mealy breakdown with attendant splitting. This difficulty has been ascribed to overmaturity and to be favored by late harvest and delayed storage. The fruits used in this test were stored promptly, and in no instance showed splitting. Apparently the improved size, color, and quality were secured without the fruit becoming over-ripe.

Pressure tests taken April 22, 1943, showed about the same average pressure for the hormone and adhesive-held fruits (5.22 and 5.23), but considerably higher pressure (6.25) for the earlier harvested fruits.

An examination of 25 fruits from each lot for evidence of brown core showed that all 25 had moderate browning from the check lot, and 7 and 13 respectively had slight browning from the hormone and adhesive-held lots. All of the fruit had been held for about a month in storage at about 40 degrees F., following very good storage conditions at 32 degrees F. up to that time.

#### Conclusions

The Rhode Island published report concludes:

"These limited data seem to indicate an increase in fruit size to offset moderate fruit drop, improved color, eating quality, and less brown core developed in McIntosh apples held upon the trees longer by means of hormone sprays or mechanical means. Delayed harvest did not result in poorer keeping quality, and the fruit was acceptable through mid-April. These data further support the use of hormone sprays to reduce excessive drop and spread the labor load."

#####

"FERMATE" FUNGICIDE OFFERS NEW REMEDY FOR CONTROL OF BEAN ANTHRACNOSE

A new chemical treatment that will protect beans grown from anthracnose-infected seed and prevent spread of the disease to adjacent plants has been discovered.

In studies at the Agricultural Experiment Station at Geneva, N. Y., anthracnose spread uniformly throughout unsprayed plots, but appeared only rarely in plots sprayed with "Fermate," new organic fungicide containing ferric dimethyl dithiocarbamate.

The spray treatments effectively reduced the severity of infection and saved about 30 per cent of the pods. There was no evidence that the spray injured the plants or reduced the yield of pods.

"The results of this test are of considerable interest because they suggest a new remedy for bean anthracnose," says the Station periodical "Farm Research," Vol. 10, No. 2. It adds that use of the new fungicide offers "a promising approach toward an old problem;" cautioning, however, that the test must be considered preliminary because it was not repeated under different weather conditions on different farms.

"The effective control of anthracnose is particularly encouraging because the seed was almost 100 per cent infected and of such poor quality that no informed grower would consider using it," the article says. "An almost perfect control might be expected in an average field where only one or two infected seeds might occur in each 100."

Fungus Attacks Pods, Leaves, and Stems

"The disease is caused by a fungus (*Colletotrichum lindemuthianum*) that attacks pods, leaves, and stems. The anthracnose of tomatoes, caused by a closely related fungus, has been effectively controlled by a new organic sulfur known as 'Fermate', and tests with this fungicide against bean anthracnose were considered desirable."

In the experiment, severely infected bean seeds of the Cranberry variety were planted in pairs of rows interspersed between rows planted with disease-free seed of the same variety. A plot consisting of eight rows, 200 feet long, was divided into four blocks. The second and fourth blocks were left unsprayed to measure the severity of anthracnose infection from infected seed, and the rate of spread into the parallel rows grown from disease-free seed. The remaining two blocks were sprayed with "Fermate" (2 pounds to 100 gallons) at 10- to 14-day intervals, beginning when the first true leaves were fully expanded. The plants from both infected and healthy seed were sprayed five times at the rate of about 150 gallons per acre at 300 pounds pressure.

Continued on next page

#### Weight of Vines and Pods And Amount of Infection Recorded

"Anthracnose appeared about August 15 and spread uniformly throughout the unsprayed plots," the report says, "but only rare, isolated spots of infection appeared on the sprayed plots. Six groups of 50 plants each were pulled from different sections of each block on September 1, and records were taken on the weight of vines and pods and amount of infection. The averages of these six records for each block are given in the following table:

Effect of "Fermate" Spray on Size of Cranberry Bean Plants  
and Severity of Anthracnose Infection

Spray Treatment Applied to Plants	Weight of 50 Plants Oz.	Weight of Pods per Plant Oz.	Pod Infection	
			Severe	Light
			Per Cent	
Fermate	194.52	1.65	6.42	3.42
None	209.09	1.65	14.17	30.15
Fermate	208.70	1.77	2.08	1.15
None	145.27	1.28	16.90	15.68

The Geneva report points out that it was possible to measure the effectiveness of the "Fermate" in preventing spread of the disease from infected plants by examining plants grown from disease-free seed between rows from infected seed. These plants, on September 14, showed 34.7 and 36.0 per cent severe pod infection in the two unsprayed blocks as compared to none and 3.2 per cent in the sprayed area.

#####

#### INCREASED EFFICIENCY RESULTS FROM PROPER FERTILIZER PLACEMENT

A big saving in land area and farm labor results from proper placement of commercial fertilizers in the soil, according to G. A. Cumings, Agricultural Engineer of the U. S. Department of Agriculture.

Mr. Cumings attributes increased efficiency in fertilizer use to better-prepared fertilizers and to proper placement "in accordance with the needs and sensitivities of crops."

He points out that recent studies in fertilizer placement in the plow furrow below the depth where soil commonly becomes dry in midsummer had already resulted in four manufacturers turning out several thousand plow attachments for applying fertilizer in this manner.

#####

PHENOTHIAZINE IN REGULAR MASH CONTROLS CECAL WORMS IN CHICKENS

Recent research shows that group treatment of chickens by incorporating phenothiazine in the regular mash is a practical way to remove cecal worms (*Heterakis gallinae*) from the birds.

In experiments conducted by the U. S. Dept. of Agriculture, involving 44 heavily infested adult Rhode Island Reds, it was found that about one-half to one gram of the drug per bird, eaten as part of the mash over a period of 6½ to 7½ hours, removed most of the cecal worms.

Cecal worms in chickens and turkeys cause typhlitis and act as vectors or carriers of enterohepatitis, the dread disease commonly known as "blackhead."

Olivier, Allen, and Hardcastle, poultry parasitologists of the U. S. Bureau of Animal Industry at Beltsville, Md., report conclusions regarding the efficiency of phenothiazine, based on three separate U. S. D. A. experiments in which the drug was mixed in the regular mash.

Did Not Affect Appearance or Weight of Birds

They found that "Phenothiazine, as used in these experiments, did not affect the appearance or weight of the birds and was, therefore, apparently harmless." Their report continues:

"In a preliminary experiment, nine birds that had been fasted for 16 hours were fed medicated mash for 1 hour. The average intake of drug per bird was 0.4 gram. This treatment removed only 57 per cent of the worms, possibly because the treatment period was too short to insure that all the birds consumed an effective quantity of the drug.

"In a second experiment, eight birds were given individual treatment with medicated mash over a period of 7½ hours, following a 16-hour fast. The intake per bird ranged from 0.46 to 0.91 gram of phenothiazine. All but 1 of 655 cecal worms harbored by these birds were removed.

"In a third experiment, eleven birds kept in a range shelter were allowed access to a mixture of 660 grams of mash and 11 grams of phenothiazine for 6½ hours following a 17-hour fast. The average intake of phenothiazine was 0.81 gram per bird." At autopsy, three days later, only 15 worms were recovered from the treated birds. At the same time, 1,105 worms were recovered from 11 untreated birds.

#####

DOSING WITH PHENOTHIAZINE ONE WAY TO SAVE HOG FEED

Experts say a worm-infested pig, if it lives, requires one-fifth more feed to reach the same weight as an uninfested one. Since about half of the pigs in the United States are said to be infested, elimination of internal parasites would save great quantities of feed. It would also save many hogs. Veterinarians estimate that worms kill one pig in ten.

By wide experiments and use, phenothiazine has proved to be the only drug that will control nodular worms. It also controls roundworms or Ascarids as effectively as other commonly used anthelmintics, and has the advantage that it can be administered in feed.

Individual doses of pellets, tabs, or drench with a syringe are also commonly used.

U. S. D. A. Issues New Phenothiazine Summary

A mimeographed article, "Phenothiazine for the Control of Parasites of Farm Animals," by A. O. Foster and R. T. Habermann, recently issued by the U. S. Bureau of Animal Industry, includes recommendations for administering phenothiazine to different classes of livestock. Regarding swine, it says in part:

"Phenothiazine is extensively used to remove large roundworms, Ascaris lumbricoides suis, from growing pigs and, to a lesser extent, as a specific for removing nodular worms, Oesophagostomum spp."

The summary points out that phenothiazine may be easily administered to a group of pigs at one time by incorporating the required amount into almost any feed to which the animals are accustomed. It adds:

"When the drug is given in this manner, experience has shown that it should be administered at the rate of about 0.1 gram per pound of live weight, or about 4 grams each to pigs weighing approximately 40 pounds. Reasonable approximations of this dosage are obtained by employing one-fourth pound of phenothiazine for approximately 35 thirty-pound pigs, or 25 forty-pound pigs, or 20 fifty-pound pigs. The drug should be thoroughly mixed into the ration of grain, milk, or slops which is customarily given to the animals at one feeding. Groups for mass treatment with medicated feed should not be larger than indicated by the above numbers, and the pigs in each group should be fairly uniform as to weight and age. There should, of course, be sufficient room at the trough for all the animals in a group to feed at the same time."

The article cautions against overdosing, pointing out that in general pigs under three months of age appear to be somewhat more susceptible to various toxic reactions following treatment than do older animals, while those over five months tolerate the drug relatively well.

#####

SMEAR 62 INCLUDED AMONG MOST IMPORTANT RESULTS OF RECENT RESEARCH

Smear 62, a simple screwworm remedy made by mixing diphenylamine, benzol, turkey-red oil, and lampblack, is included in the U. S. D. A. mimeographed publication, dated May 6, 1944, entitled "Most Important Research Achievements of the Department of Agriculture Scientists During Recent Years."

The paragraph on Smear 62 says: "This smear was developed at the laboratory at Menard, Texas, as a combined effort of the laboratory, largely the work of Roy Melvin. Its first practical test on a large scale was made in the summer of 1941. It is now widely used throughout the area where screwworm occurs, and has probably been largely responsible for holding to a minimum an excessive and widespread outbreak this season, with resulting savings of millions of dollars worth of cattle."

U. S. D. A. WARNS STOCKMEN OF THREATENING SCREWWORM OUTBREAKS

Western and southern livestock producers and dealers are advised by the U. S. Department of Agriculture to take immediate precautions against threatening screwworm infestations which this year are approaching "the proportions of a major outbreak."

According to surveys made by the Bureau of Entomology and Plant Quarantine in cooperation with the Agricultural Extension Service, screwworm infestations in Oklahoma, Kansas, and the western half of Texas are unusually heavy. Also seriously affected are north Florida, Georgia, Alabama, and areas along most of the immediate Gulf Coast.

A recent statement issued by the federal agricultural authorities says:

"Stockmen are urged to treat every case of screwworm with Smear 62, a remedy which prevented serious losses last year, and to obtain information from county agricultural agents concerning further control measures."

The specialists say it is highly important that all surgical wounds of livestock, including those from castration, docking, and dehorning, be avoided during the period of greatest danger which may last for several weeks.

-----

NOTE: A new U. S. D. A. publication, Circular No. 162, "Screwworm Control," by W. E. Dove, is now available upon request to the Office of Information, U. S. Department of Information, Washington 25, D. C. This circular was reviewed in our July-August issue.

#####

---

How to Recognize the Screwworm -- and How It Operates

---

The adult screwworm fly is blue-green with three darker stripes down its back. It closely resembles the medium-sized greenbottle fly or blowfly. Unlike the common blowfly, however, it lays its eggs in fresh wounds and not on carrion or in festering wounds.

The adult female may lay several hundred eggs, usually in lots of about 100 each. These hatch in a few hours, and small maggots at once enter the wound and begin to feed. As they grow, they penetrate deeper into the flesh, enlarging the wound and preventing it from healing. If not treated, severe cases usually result in the death of the animal.

The screwworm maggot is about an inch long when mature, tapering from a pointed head end to a broad posterior end. It may become full-grown in a week or less, after which it drops out of the wound. Then after entering the ground, it changes through a bean-shaped brown resting stage to the adult winged fly, ready to attack wounds on other animals.

---

MISSOURI LEAFLET WARNS SCREWORM MENACE MOVING NORTH!

While the screwworm fly is a native of the tropics and breeds abundantly in Southern states, it has more recently moved northward to damage livestock in areas where it once presented no serious threat.

In Missouri, for example, entire counties that ordinarily are free from this insect, are now overrun during some summers, with resultant illness and death of many cattle, hogs, sheep, and other animals. Several cases of attack on man have been reported in farm communities where animal infestation has been severe.

Dr. Leonard Haseman, Missouri College of Agriculture, recognizing the threat to livestock in his state, recently issued a leaflet, Missouri Agricultural Experiment Station Circular No. 264, entitled "Screwworm Menace to Livestock," warning against the spread of this pest.

"In the deep south the pest continues to breed all year," he says. "Maggots carried north in infested animals may mature and emerge as flies by early May. Thereafter, a new generation of the pest may mature every 15 to 30 days, and by fall a region may become very heavily infested."

The Missouri entomologist says barbwire cuts, castration wounds, horn injuries, ringing and tusk injury on hogs, and similar fresh bloody wounds are all attractive to the pest for egg-laying.

Continued on next page

"Each animal in livestock shipments from the south or southwest should be carefully checked to be sure that none have wounds infested with this maggot," he says. "The carcass of any animal dying from maggot attack should be buried or otherwise disposed of promptly. As the summer advances, dairymen and livestock men should be careful to treat promptly all wounds whether or not this pest is known to be present in the neighborhood. Any wounds found infested with maggots should be treated promptly with a chemical to kill all the maggots, after which a repelling disinfectant should be used to prevent reinfestation."

#### Smear 62 -- Combined Screwworm Killer and Wound Protector

Pointing out that benzol is perhaps the best chemical to kill the maggots, and that diphenylamine is the recommended wound protector, Dr. Haseman describes a combined screwworm killer and wound protector, recently developed by the Bureau of Entomology and Plant Quarantine, known as Formula No. 62.

He says Formula or Smear No. 62 "can be prepared by dissolving 6 ounces of diphenylamine in 6 ounces of commercial benzol, which may require 24 hours, after which 2 ounces of neutral turkey-red oil and 4 ounces of lampblack are stirred in to form a smooth mixture of about the thickness of molasses. This mixture can then be applied to the infested wound by means of a cheap paint brush. If properly prepared and applied, it will kill the maggots in the wound and prevent reinfestation for a number of days, or frequently until the wound completely heals."

Commercial preparations, made according to Formula No. 62, are now available through most veterinarians and veterinary supply houses.

#####

#### NO LONGER ANY NEED TO GIVE STINKING-SMUT FUNGI FREE BOARD

Means are now at hand to enable American farmers "to eliminate stinking smut of wheat from every field that will be harvested in 1945," says Dr. Willard F. Crosier of the State Experiment Station at Geneva, N. Y. He says that manufacturers of agricultural chemicals have provided sufficient seed-disinfecting materials to destroy the smut fungus wherever this microscopic pest is a problem. This fungus shows up wherever wheat is grown. It steals its sustenance by entering, and obtaining free board at the expense of, the host wheat plant.

Dr. Crosier says several fungicides are effective, but since the introduction of volatile mercurials, New Improved "Ceresan" seed disinfectant "has been the most popular material for control of grain smuts," of which stinking smut is the most destructive.

#####

BOOKLET GIVES NON-TECHNICAL FACTS ON CARE OF ENGINE'S COOLING SYSTEM

You do not have to be an engineer or a mechanic to understand the fundamental facts that automotive cooling systems require cleaning, checking, and service at least twice a year, in addition to ordinary care, regardless of whether the automobile, tractor, or truck is operated in the city or on the farm.

Information Based on Many Years of Engineering Research

This is brought out in a non-technical illustrated booklet, with data based on many years of research by Du Pont and other automotive engineers, entitled "Take Care of Your Cooling System." A copy of this publication, newly revised, will be sent on request to the Editor, Du Pont "Agricultural News Letter," Wilmington 98, Delaware.

The booklet is designed to show how the cooling system works, to explain how to prevent cooling-system troubles, and to point out the value and economy of regular service and attention.

Basic Purpose of Cooling System Is To Transfer Heat From Engine

It says about one-third of the gasoline's energy is converted into power and two-thirds into heat, and that this heat must go somewhere.

"Some of the heat goes out through the exhaust; the rest must be dissipated through a cooling system of some kind," it adds. "Since an automobile requires about 100 gallons of cool water a minute, you would have quite a time carrying enough water -- unless you found some method of cooling and using the same water over and over again. The modern automobile cooling system is designed to do just that."

The discussion points out that the cooling system consists primarily of water passages, a radiator, a fan, a pump, and a thermostatic valve, and outlines the functions of each. It explains how to detect and cure the most common mechanical troubles connected with fan and fan-belt, thermostat, rubber hoses, radiator, radiator caps and overflow pipe, water pump, and gaskets.

Some of the Questions That are Answered

A few of the questions that are answered include: How can a cooling system of a car, truck, or tractor, be cleaned, and the rust, corrosion, and scale removed? How can the cooling system be protected against damages resulting from freezing in winter? How can leaks be detected and sealed?

Continued on next page

### Three Types of Anti-Freeze In General Use

In explaining the types of anti-freeze generally used, the booklet says:

Methanol -- The most effective anti-freeze material, quart for quart, because smaller quantities are needed for a given degree of protection. It is also a most effective heat-transfer medium. Du Pont "Zerone" anti-freeze is made with methanol as a base.

Ethylene Glycol -- A non-evaporating, high-boiling anti-freeze material. Recommended especially for heavy-duty and wherever conditions demand an anti-freeze that will stand high temperature. During wartime the supply is limited and, therefore, your local dealer may not always be able to furnish this type of anti-freeze. Du Pont "Zerex" anti-freeze is based on ethylene glycol. It is ideal for those who are willing to pay a little more for the freedom from winter worries.

Ethanol -- Mixes readily with water and has good heat-transfer properties, but somewhat more ethanol than methanol is required. Du Pont War Emergency "Zerone" has an ethanol base. Don't hesitate to accept it when your dealer cannot supply you with regular "Zerone".

#####

### THE IMPORTANCE OF HALF AN EGG

The average American today eats less than one egg a day. This is true despite the fact that per capita egg consumption right now is the highest in history and that many nutritionists say every individual should eat at least one and preferably two eggs every day in the year. The gain from 280 eggs per person per year in 1935 to 344 today results from the fact that eggs have replaced other war-scarce foods and not because the consumer has any great appreciation of his need for more eggs, says the current issue of Du Pont's "Poultry Comment."

The article explains that to bring the average American to the egg-a-day basis would require something like 50 billion eggs a year. This would result in no production problem, since the hen-houses of the United States last year turned out close to 60 billion eggs, creating a sizeable surplus. The importance of half an egg is shown by the fact that the recommended egg and a half per day per capita would require approximately 72 billion eggs, an increase of more than 12 billions over current output.

#####

### DITCH DYNAMITING "BLOWS AWAY" FLOOD TROUBLES IN IOWA

The problems of county engineers in Iowa, besieged by flood and faced with the necessity of saving war-vital crops and keeping highways open, were "blown away" recently by quick, efficient, money-saving ditch dynamiting.

To deal with the havoc of floods, many of Iowa's 99 counties were faced with the necessity of quickly repairing damage, despite a shortage of manpower and equipment. Not only were roads and bridges washed out, but inadequate roadside drainage allowed water to stand over right-of-ways. Trapped water held useless thousands of acres of normally productive land.

In some districts the emergency was so great that vast areas of water had to be drained off within 24 hours to save newly planted crops. Since heavy mechanical equipment could not be used even were it available, county engineers sought the aid of Du Pont dynamite experts, who had been demonstrating the technique to landowners.

#### An Instance of Emergency Service

An instance of emergency service was the saving of most of a bridge which had been severely damaged by flood waters cutting a new channel. With ditching dynamite, Du Pont engineers blasted a new channel eight feet deep and 25 feet wide within a few hours. The county was able to start repairs immediately, instead of having to plan and build a new bridge.

In Chickasaw county, the blasting of a ditch three feet deep and one-and-a-half miles long reclaimed 300 acres of good farm land in a matter of hours instead of weeks.

The cost of blasting these ditches was less than half the cost of using a dragline, even without considering the saving of time. And many of the counties had only one dragline, usually hard-pressed even without an emergency.

#### Ditches Excavated Almost Instantaneously

Ditches are usually dynamited by the so-called "propagation" method, which requires the placing of a number of specially formulated dynamite sticks at depths and distances dictated by local conditions. One stick is set off by a cap exploded by conventional methods, and the others are exploded in quick, even succession by shock waves carried by the water in the soil. The ditch, regardless of length, is excavated almost instantaneously. If you can pick up a handful of mud and squeeze water through your fingers, there is enough moisture for the "propagation" method.

Continued on next page

Results of such methods can be closely controlled. The depth of the ditches is constant and the debris is blown to either side, scattered evenly at a distance governed by wind conditions at the time, thus eliminating soil banks at the sides of the ditch.

-----

NOTE: A new bulletin entitled "Blasting Ditches With Explosives," recently issued by the Du Pont Explosives Department, will be sent on request to the Editor, Du Pont "Agricultural News Letter," Wilmington 98, Delaware.

#####

U. S. D. A. SAYS DDT NOT EFFECTIVE FOR ALL PURPOSES -- NEEDS FURTHER TESTING

DDT, much publicized as a louse powder and fly spray, is not a universal insecticide, effective for all agricultural purposes. So warns Dr. P. N. Annand, Chief, U. S. Bureau of Entomology and Plant Quarantine, whose statement says:

"We receive many requests for supplies of DDT, and for information about it, particularly from insecticide dealers, farmers, and Victory gardeners. DDT is not now available for civilian use. While it appears to be very promising for future control of many insect pests, many of the experiments to test its effects on insects, plants, and higher animals are still in preliminary stages. Later tests may change the entire picture materially.

"Our entomologists have not had large enough supplies available to make large-scale tests. Consequently, we are not in a position at this time to recommend general use of DDT as an insecticide for agricultural purposes."

The statement points out that results of tests to determine the true value of DDT for the control of certain insects will be made known from time to time, and will be the basis for whatever recommendations are made by the entomologists.

#####



